



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/814,324	03/21/2001	Motohiro Kawahito	JP919990309US1	3779

7590

04/20/2004

Casey August
Intellectual Property Law Dept.
IBM Corporation
P.O. Box 218
Yorktown Heights, NY 10598

EXAMINER

NAHAR, QAMRUN

ART UNIT	PAPER NUMBER
----------	--------------

2124

DATE MAILED: 04/20/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/814,324

Applicant(s)

KAWAHITO ET AL.

Examiner

Qamrun Nahar

Art Unit

2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-16 have been examined.

Specification

2. The disclosure is objected to because of the following informalities: on page 18, lines 13-17, the section called "Description of the symbols" should be removed. This description of the symbols should accompany the description of Figure 2 in the Description of Preferred Embodiments section of the specification.

Appropriate correction is required.

Claim Objections

3. Claim 5 is objected to because of the following informalities: "process was performed" on the last line of the claim should be "process is performed". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "said exception program" in line 9 of the claim. There is insufficient antecedent basis for this limitation in the claim. This limitation is interpreted as "said exception process".

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-2, 4, 6-7 and 10-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Dunn (U.S. 6,247,172).

Per Claim 1:

The Dunn patent discloses:

- **a compiler for converting source code for a program written in a programming language into object code in a machine language** ("A compiler translates source code written in a high order software language, such as C or pascal, into target code 38, which is an executable application operable on the target platform." in column 5, lines 33-36)

- an optimization execution unit for performing an optimization process for an object program written in a machine language (“The new translator 34, according to the present invention, generates both optimized target code 40 and recovery blocks 42. The new exception delivery system described in Fig. 5, allows the optimized target code 40 to be fully optimized. All optimizations possible in traditional optimization for branching are now legal for the trapping of exceptions.” in column 5, lines 37-42)

- and a program modification unit for modifying said object program in order to absorb a difference in content between the point of origin of an exception process, which occurs in response to the execution of a command in said object program, and a location whereat said exception process is performed (“The recovery blocks 42 contains code instructions that when executed restore the target machine state to match the legacy machine state. The recovery blocks 42 can be generated at the same time as the optimized target code 40 for a non-dynamic translation, or can be generated on an “as needed” basis in a dynamic translation. In a non-dynamic system, the translator produces many recovery blocks, up to one for every potential synchronous exception in the optimized target code 40.” in column 5, lines 42-51).

Per Claim 2:

The Dunn patent discloses:

- wherein, if there is a difference in content between the point of origin of an exception process, which occurs in response to the execution of a command in said object program,

Art Unit: 2124

and a location whereat said exception process is performed, said program modification unit generates compensation code to compensate for said difference, and inserts said compensation code into said object program (column 5, lines 42-51).

Per Claim 4:

The Dunn patent discloses:

- wherein, before said optimization execution unit performs said optimization process in said object program, said program modification unit divides said command that may cause an exception process into a command portion for determining whether an exception process has occurred, and a command portion for actually causing an exception process; and wherein, when an exception process occurs, said program modification unit modifies said object program to shift program control to said command portion that actually caused said exception process (column 6, lines 1-35).

Per Claim 6:

This is a system version of the claimed compiler discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above.

Thus, accordingly, this claim is also anticipated by Dunn.

Per Claim 7:

This is a method version of the claimed compiler discussed above (claims 1 and 2), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above, including “moving program control to a portion whereat said exception process is performed” (column 6, lines 10-15). Thus, accordingly, this claim is also anticipated by Dunn.

Per Claim 10:

The Dunn patent discloses:

- **an optimization method for optimizing a program to increase processing efficiency**
(column 5, lines 37-39)
- **dividing code, in an object program, that may cause an exception process into code for determining whether an exception process has occurred and code for actually causing an exception process** (column 5, lines 39-51)
- **specifying said code obtained at said division step as branches of a control flow graph; designing said control flow graph so that when an exception process occurs, program control is shifted to said code that actually caused said exception process; and performing said optimization process for said object program that has been modified** (column 6, lines 1-35).

Per Claim 11:

The Dunn patent discloses:

- **determining whether code for compensating for a difference in content between the point of origin of an exception process and code for actually causing said exception process have been generated in a block that includes code for the actual performance of said exception process after the optimization process has been run; and using said control flow graphs, when said code for compensating for said content difference is not generated, for synthesizing said two code sets to obtain said code arrangement that existed before said code was divided** (column 5, lines 45-48 and column 6, lines 19-23).

Per Claim 12:

This is a computer program version of the claimed compiler discussed above (claims 1 and 2), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also anticipated by Dunn.

Per Claim 13:

This is a computer executable program version of the claimed compiler discussed above (claims 1 and 2), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also anticipated by Dunn.

Per Claim 14:

The Dunn patent discloses:

- wherein said function for determining whether an exception process has occurred is provided by a condition branch (column 6, lines 56-67 to column 7, lines 1-6).

Per Claim 15:

This is a storage medium version of the claimed compiler discussed above (claims 1 and 2), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also anticipated by Dunn.

Per Claim 16:

This is a apparatus version of the claimed compiler discussed above (claims 1 and 2), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also anticipated by Dunn.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3, 5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn (U.S. 6,247,172) in view of Ghosh (U.S. 6,412,109).

Per Claim 3:

The rejection of claim 1 is incorporated, and Dunn further teaches wherein said program modification unit includes: a pre-processor for, before said optimization execution unit performs said optimization process, examine a command that may cause an exception process in said object program to determine whether an exception process has occurred, and performing an inherent process when it is found an exception process has occurred (column 6, lines 1-18), and a post-processor for examining, in said object program that has been optimized by said optimization execution unit, said command that may cause an exception process to determine whether a difference in content exists between said command that may cause said exception process and a location whereat said exception process is performed, and for, when a difference exists, generating a compensation code, to be used to compensate for said difference, and a code for, after said compensation code is obtained, moving program control to said location whereat said exception process is performed (column 6, lines 19-35). Dunn does not explicitly teach try-catch blocks for handling exceptions. Ghosh teaches try-catch blocks for handling exceptions (column 5, lines 26-34).

It would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the compiler disclosed by Dunn to include try-catch blocks for handling exceptions using the teaching of Ghosh. The modification would be obvious because one of ordinary skill in the art would be motivated to increase the amount of code that can be optimized, even code that is associated with a try-catch block (Ghosh, column 6, lines 51-60).

Per Claim 5 (as best understood):

This is another version of the claimed compiler discussed above (claims 3 and 4), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 8:

This is a method version of the claimed compiler discussed above (claims 1 and 3), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 9:

The rejection of claim 8 is incorporated, and Ghosh further teaches wherein said step of determining whether a difference in content exists between said command that may cause an exception process and said location whereat said exception process is performed includes a step of: removing said basic block prepared for said command that may cause an exception process when no difference in content exists (column 6, lines 51-55).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. Any inquiry concerning this communication from the examiner should be directed to Qamrun Nahar whose telephone number is (703) 305-7699. The examiner can normally be

Art Unit: 2124

reached on Mondays through Thursdays from 9:00 AM to 6:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki, can be reached on (703) 305-9662. The fax phone number for the organization where this application or processing is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QN
April 7, 2004

A handwritten signature in black ink, appearing to read 'Todd Ingberg', with a long, sweeping horizontal line extending from the end of the signature.

TODD INGBERG
PRIMARY EXAMINER